

BUILDING THERMOTECHNICS

The **general objective** of the discipline: understanding the behavior of construction elements with the role of thermal insulation and their dimensioning from the point of view of performance requirements related to heat and mass transfer.

Course content (2 hours / week):

- Introduction to building thermotechnics
- Climate parameters
- 1D steady-state thermal behaviour of building components
- Insulating materials
- Heat transfer of elements through the ground
- Glazing system
- Thermal balance of buildings
- Unsteady-state heat transfer
- Mass transfer in construction elements
- Thermal comfort in buildings

Laboratory (1 hour / week):

- Laboratory measurements in building thermotechnics: temperature, thermal conductivity, Infrared imaging, numerical modeling of thermal bridges, computation of confort indexes.

Energy Performance Certificate HM Government

Dwelling type: Semi-detached house Reference number: [redacted]
 Date of assessment: 06 January 2016 Type of assessment: RdSAP existing dwelling
 Date of certificate: 07 January 2016 Total floor area: 78 m²

Use this document to:

- Compare current ratings of properties to see which properties are more energy efficient
- Find out how you can save energy and money by installing improvement measures

Estimated energy costs of dwelling for 3 years:	£ 3,261
Over 3 years you could save	£ 1,440

Estimated energy costs of this home

	Current costs	Potential costs	Potential future savings
Lighting	£ 312 over 3 years	£ 155 over 3 years	
Heating	£ 2,550 over 3 years	£ 1,413 over 3 years	
Hot Water	£ 399 over 3 years	£ 252 over 3 years	
Totals	£ 3,261	£ 1,821	You could save £ 1,440 over 3 years

These figures show how much the average household would spend in this property for heating, lighting and hot water and is not based on energy used by individual households. This excludes energy use for running appliances like TVs, computers and cookers, and electricity generated by microgeneration.

Energy Efficiency Rating

Current	Potential
54	64

The graph shows the current energy efficiency of your home. The higher the rating the lower your fuel bills are likely to be. The potential rating shows the effect of undertaking the recommendations on page 3. The average energy efficiency rating for a dwelling in England and Wales is band D (rating 60). The EPC rating shown here is based on standard assumptions about occupancy and energy use and may not reflect how energy is consumed by individual occupants.

Top actions you can take to save money and make your home more efficient

Recommended measures	Indicative cost	Typical savings over 3 years
1 Internal or external wall insulation	£4,000 - £14,000	£ 1,017
2 Floor insulation (suspended floor)	£800 - £1,200	£ 153
3 Low energy lighting for all fixed outlets	£50	£ 132

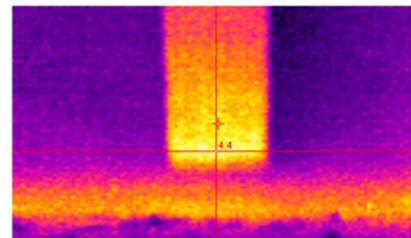
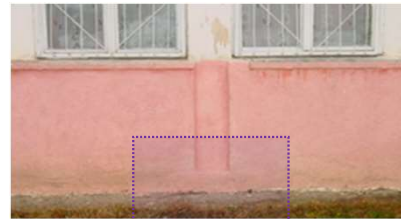
See page 3 for a full list of recommendations for this property.
 To find out more about the recommended measures and other actions you could take today to save money, visit www.gov.uk/energy-grants-calculator or call 0300 123 1234 (standard national rate). The Green Deal may enable you to make your home warmer and cheaper to run.

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Current rating **54**

Higher CO₂ emissions Lower CO₂ emissions

Potential rating **64**

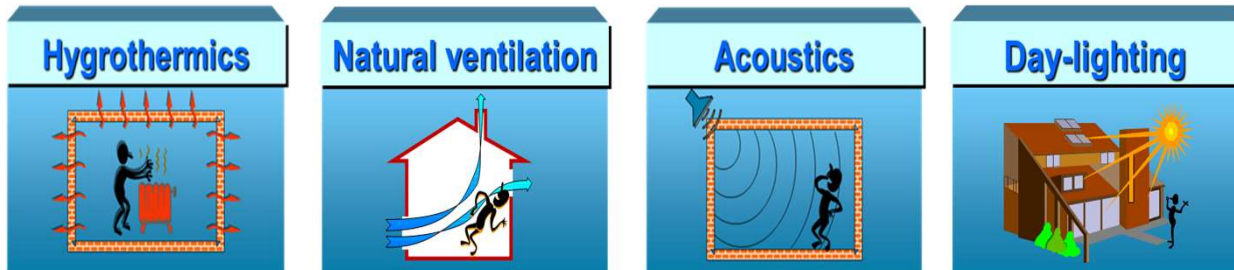


BUILDING PHYSICS – 3K (periodic evaluation)

General objective:

The **Building Physics** course aims to provide a detailed knowledge of the main scientific principles of heat, light and sound in the building engineering context.

It offers a greater understanding of the topics necessary for the conception and design of buildings in the spirit of sustainable development, involving the fulfilment of thermal, acoustic and visual comfort requirements with as little energy consumption and as few adverse effects on the environment as possible.



Benefits:

- ✓ Capital cost reduction: Better design decisions and reduced design fees
- ✓ Operating cost reduction: Energy efficiency, resulting in lower energy bills and lower exposure to energy price rises
- ✓ Creative design focused on real-life building performance rather than compliance
- ✓ Occupant satisfaction: High performance buildings can result in better productivity and comfort of the occupants

Contents:

- ❑ Design climate parameters
- ❑ Heat transfer in buildings
- ❑ Behaviour of building elements at heat transfer in stationary and variable regime
- ❑ Air humidity and water vapour condensation
- ❑ Hygrothermal criteria for the design of building envelope
- ❑ Natural ventilation of buildings
- ❑ Building acoustics
- ❑ Natural lighting of buildings
- ❑ Laboratory works - Principles of laboratory measurements in building physics, Temperature measurements, Measurement of moisture content, Determination of the ventilation rate, Determination of the degree of airborne sound insulation, Measurement of illuminance